Chapter 6.6 VIRGINIA COASTAL PROGRAM

Virginia's coastal zone encompasses all of Virginia's Atlantic coast watershed as well as parts of the Chesapeake Bay and Albemarle/Pamlico Estuary watersheds. This coastal zone area, also known as Tidewater Virginia, includes 29 counties, 15 cities, 42 towns, as well as all waters therein and out to the three-mile Territorial Sea boundary.

The Virginia Coastal Resources Management Program, commonly known as the *Virginia Coastal Program*, was established in 1986 to protect and enhance these coastal resources. The program is a network of state agencies and Tidewater local governments that implement laws and policies to carry out this responsibility as authorized under the federal Coastal Zone Management Act of 1972, as amended. Through this network, the Program manages sand dunes, wetlands, underwater lands, fisheries, point and nonpoint source air and water pollution, shoreline sanitation and a variety of other areas of particular concern such as coastal wildlife habitats and public access, waterfront redevelopment and underwater historic sites. See http://www.deq.state.va.us/coastal/ for more details about this network and the laws and policies that define Virginia's Coastal Resources Management Program.

Executive Order Number Twenty-Three (2002) signed by Governor Mark Warner in June 2002, continuing the Virginia Coastal Program. It directs all state agencies to carry out their legally established duties consistent with the Coastal Program in a manner that promotes coordination among agencies in achieving the Program's goals and objectives (see http://www.deq.state.va.us/coastal/exorder.html):

Coastal Resource Protection

Goal 1. *To protect and restore coastal resources, habitats, and species of the Commonwealth. These include, but are not limited to, wetlands, subaqueous lands and vegetation, sand dune systems, barrier islands, underwater or maritime cultural resources, riparian-forested buffers, and endangered or threatened species.*

Goal 2. *To restore and maintain the quality of all coastal waters for human and ecosystem health through protection from adverse effects of excess nutrients, toxics, pathogens, and sedimentation.*

Goal 3. *To protect air quality.*

Goal 4. *To reduce or prevent losses of coastal habitat, life, and property caused by shoreline erosion, storms, and other coastal hazards in a manner that balances environmental and economic considerations.*

Coastal Resource Sustainable Use

Goal 5. *To provide for sustainable wild fisheries and aquaculture.*

Goal 6. *To promote sustainable ecotourism and to increase and improve public access to coastal waters and shorefront lands compatible with resource protection goals.*

Goal 7. *To promote renewable energy production and provide for appropriate extraction of energy and mineral resources consistent with proper environmental practices.*

Coastal Management Coordination

Goal 8. *To ensure sustainable development on coastal lands and support access for water-dependent development through effective coordination of governmental planning processes.*

Goal 9. *To avoid and minimize coastal resource use conflicts through research, planning, and a forum for coordination and facilitation among government agencies, interest groups, and citizens.*

Goal 10. *To promote informed decision-making by maximizing the availability of up-to-date educational information, technical advice, and scientific data.*

Core regulatory agencies in the Virginia Coastal Program network include the Marine Resources Commission (VMRC), the Department of Environmental Quality (DEQ), the Department of Game and Inland Fisheries (DGIF), the Department of Conservation and Recreation (DCR), the Virginia Department of Health (VDH), and the Chesapeake Bay Local Assistance Department (CBLAD). Other agencies participating in the Program include the Department of Historic Resources (DHR), Department of Forestry (DOF), Department of Agriculture and Consumer Services, the Virginia Institute of Marine Science (VIMS), the Virginia Economic Development Partnership (EDP) and the Virginia Department of Transportation (VDOT). DEQ serves as the lead agency for Virginia's networked Coastal Program, and helps agencies and localities to develop and implement coordinated coastal policies.

By virtue of having a federally approved Coastal Program, Virginia also has the authority to require that federal actions within the coastal zone be consistent with Virginia's Coastal Program. Environmental impact review staff at DEQ review federal actions in the coastal zone for consistency with Virginia's Coastal Program laws and policies. Together, Virginia's localities, state agencies and NOAA form an effective intergovernmental partnership.

Coastal Zone Management Act Funding Received by Virginia

In addition to providing a forum for development and coordination of cross-cutting coastal issues, the Virginia Coastal Program provides grant assistance to state agencies and local governments. Having a federally approved coastal zone management program qualifies Virginia to receive about $3 million per year in federal funds under a formula allocation based on miles of shoreline and coastal zone population. The Office of Ocean and Coastal Resource Management at the National Oceanic and Atmospheric Administration (NOAA) allocates these funds under the Coastal Zone Management Act (CZMA). These grant funds are equally matched by Virginia's state agencies and local governments.

Since 1986, the Commonwealth has received over *$40* million in federal funds, matched by over *$35* million in state and local matching funds to implement its coastal program, and carry out a broad scope of state and local projects. Go to http://www.deq.state.va.us/coastal/funding.html for project lists and descriptions back to 1992. These projects include the following areas (water quality specific project areas are in bold):

- ***coastal technical assistance*****,** e.g. local environmental planning by regional planning district commissions and CBLAD, tributary strategy development on state and local level;
- ***enforcement,*** wetlands and dunes permit compliance and inspection by VMRC and local governments;
- ***environmental management***, e.g. support for the business and industry guide to environmental regulations, natural resource mapping by DCR and DGIF and the Elizabeth River Project Watershed Action Plan;
- ***habitat and monitoring,*** e.g**.** annual support of the Chesapeake Bay Submerged Aquatic Vegetation Survey by VIMS, oyster reef restoration, and shorebird habitat protection;
- ***land acquisition****,* e.g. New Point Comfort in Mathews County, acreage in the North Landing Natural Area Preserve in Virginia Beach, the Northwest River Natural Area Preserve in the City of Chesapeake, expansion of the Kiptopeke State Park , and habitat preservation areas on Virginia's Eastern Shore;
- ***local government planning and comprehensive plans*****,** e.g. the Gloucester County Creative Rural Development Program, Appomattox River Corridor Study, and Northern Neck Land Use Tracking and Mapping System;
- ***public access planning and construction****,* e.g. Kiptopeke State Park Boardwalk and Hawk Observatory, dune crossovers in the Town of Cape Charles, harbor improvements in the Town of Wachapreague, nature and canoe trails on the Elizabeth River and West Neck Creek, Alton's Creek Boardwalk on the North Landing River, and access planning, such as public access plans for the Dragon Run , Potomac River, and Mayo Island;
- ***public education***, e.g. A Guide to the Bay Act, the Virginia Erosion and Sediment Control Field Manual, Bayscapes, and wetlands training and education;
- ***shoreline management***, e.g. shoreline management BMP's by VMRC, and sediment suspension studies by VIMS;

- ***special area management planning*** in Northampton County and for Virginia's Southern and Dragon Run Watershed Areas;
- ***wetlands***, e.g., support for the Virginia Wetlands Management Handbook [VIMS] and the Wetlands Guidelines [VMRC], tidal and nontidal wetlands surveys and mapping, and wetlands planning and policy); and,
- ***water quality***, e.g. the Virginia Nonpoint Source Pollution Control Program [DCR], water quality modeling by VIMS, support for the Virginia Citizen Water-Quality Monitoring Program, fecal coliform studies by VA Tech, Chesapeake Bay Preservation Area Program implementation and mapping by Virginia's Bay localities, stormwater and groundwater studies, and support of the Polecat Creek Watershed Project at CBLAD.

Current and Ongoing Virginia Coastal Program Initiatives

Several new and ongoing efforts exemplify the Virginia Coastal Program's unique opportunity to fund and support projects that protect the Commonwealth's coastal resources, while encouraging intergovernmental coordination and partnerships with a broad constituency. They include the Program's newest public-private partnership initiative – the Virginia Seaside Heritage Program, and several ongoing initiatives - the Virginia Coastal Nonpoint Pollution Program (including the Virginia Clean Marina Program), and Virginia Oyster Heritage Program. These projects address water quality issues and focus on monitoring and restoration of living resources to improve water quality in Virginia's coastal waters.

Virginia Seaside Heritage Program

SAV is dependent on good water quality to which it responds over short time scales. It can be an important indicator of water quality as well as provide habitat and reduce wave energy on adjacent shorelines. Seagrass restoration, as well as oyster restoration, is a focus of the new *Virginia Seaside Heritage Program* (VSHP).

Virginians are blessed with more than one coastal treasure. Although less famous than the Chesapeake Bay, but equally worthy, the seaside of the Eastern Shore is a magnificent and unique coastal resource.

Today, this barrier island lagoon system may feel like a wilderness, but it hasn't always been that way. British colonists landed here and Blackbeard and his pirates hid out here. By the 1800's this area was a renowned playground for hunting, fishing, and recreating for people from Washington DC to New York. Unimaginable numbers of oysters, scallops, finfish and waterfowl were devoured from its seemingly limitless cornucopia.

But all that changed with the hurricanes and storms of the late 1800's and early 1900's. Eventually all was lost, the cottages, hunt clubs, resorts and small communities. By the 1930's even the natural resources…. shellfish, underwater grasses, and birds ….were decimated.

It's been relatively quiet on the Seaside since the Great Depression. Yet sadly, over the past 30 years, we have not seen a great resurgence of underwater grasses, oysters, scallops, finfish and birds. Why, in the face of costly conservation efforts, have the resources not rebounded?

Some reasons are coming to light and some believe we have reason to hope. Through the efforts of the Virginia Oyster Heritage Program, initiated by the Virginia Coastal Program in 1999, small-scale experiments on the seaside with scattering eelgrass seed were actually taking root and flourishing and the restored oyster reefs were also doing well.

In September of 2002, the Virginia Coastal Program and its partners officially kicked off the Seaside Heritage Program. Through this new initiative, the Coastal Program will dedicate a substantial portion of the federal grant it receives from the National Oceanic and Atmospheric Administration's Office of Ocean and Coastal Resources Management each year to restoration and protection efforts on the seaside of Virginia's Eastern Shore.

The elements of this three-year program and the progress made by the end of 2003 on each is described below:

Development of a comprehensive seaside inventory of natural resources and human use patterns that would form the basis for long term restoration and management strategies:

Virginia Seaside Heritage Program partners have been developing and compiling numerous data layers from various sources. These include underwater bottom types suitable for aquaculture, prey availability and bird habitat needs, existing and potential SAV, oyster reef sites for continued restoration, bird data (e.g., migration, nesting and foraging habitats) and predator tracking. Additionally, data layers for existing water quality data and development of a process for continued collection, identification of critical *Phragmites* invasion sites, rare and threatened marsh vegetation and existing and potential public access sites for ecotourism. This data will be available on the DEQ Web site and linked to the Virginia Seaside Heritage Program Web site as it is completed.

Restoration of underwater grasses, scallops, oyster reefs, marshes and shorebird habitats:

Seagrass restoration has been "ramped up" under the Virginia Seaside Heritage Program from experimental stages to a larger scale employing the new, low-tech method of "seed broadcasting." If plots broadcast in South Bay in 2002 do as well as earlier plots in the seaside coastal bays, South Bay will have over 50 acres of SAV in less than 5 years.

The recent success of large-scale eelgrass restoration efforts on the seaside offers a unique opportunity to document the recovery of significant fishery resources and understand their role in the tropho-dynamics of these shallow seaside bays. This early stage of recovery fostered by the Seaside Heritage Program provides a most critical opportunity to collect data for a later comparison of habitat conditions when recovery is complete. As grass beds become established, scallops may naturally recolonize the areas. Juvenile bay scallops attach themselves to blades of seagrass for a short period of their development before they become free-swimming. Other shellfish and finfish species that depend on eelgrass for habitat should also become more abundant.

Oyster reef construction, supported through the Virginia Oyster Heritage Program in recent years, is also continuing under the new Seaside Heritage Program. The Virginia Marine Resources Commission has recently built oyster reefs in 5 locations from South Bay to Chincoteague Bay.

Seaside Heritage Program partners have been paying particular attention to enhancing avian habitat by minimizing the threats from predators during nesting and fledging stages on the barrier islands (i.e., intensive trapping and removal of raccoons and red foxes). Results of experimental predation management - already implemented by the Virginia Museum of Natural History and The Nature Conservancy on Metompkin and North Cedar Islands in 2000, and on Assawoman, Wreck, Ship Shoal and Myrtle Islands in 2001 - has been very encouraging. Based on the 1999 through 2002 bird surveys, the number of adult birds present during the breeding season continues to increase on Metompkin, North Cedar and Assawoman. Least terns have increased by approximately 900% on Metompkin, by 500% on North Cedar and by 100% on Assawoman. Black Skimmers and Common Terns have increased by approximately 350% and 200%, respectively, on North Cedar. Piping Plovers have increased modestly on all three islands.

Phragmites invasion has also been a concern for the Eastern Shore. Seaside Heritage Program partners are finalizing data and maps on the extent of *Phragmites* invasion into the seaside marshes in an effort to eliminate it from locations where it threatens rare marsh species or relatively pristine marshes.

Virginia Department of Conservation and Recreation biologists have set up an intensive monitoring program on Parramore Island Natural Area Preserve, which had been targeted for *Phragmites* control treatments in September of 2003 before the effects of Hurricane Isabel were felt. Isabel caused flooding of these areas and may have caused major plant/animal redistribution. Work is planned over the next two years to document the effects of the hurricane on dispersing *Phragmites* into areas where it previously did not occur, and efforts at controlling this invasive species will resume in 2004.

Development of management tools such as a use suitability model, improved enforcement capabilities and public education efforts:

Rapid growth of hard clam aquaculture in the seaside bays over the past decade has lead to a number of real and perceived user conflicts. To support the development of aquaculture practices and management options that reduce these conflicts and support environmentally-sound, sustainable aquaculture on the seaside, the Virginia Institute of Marine Science has been building on a use suitability model with the assistance of the VIMS Wachapreague Lab. This model will allow us to see where uses may conflict and to propose sensible alternatives for fair allocations of space within seaside habitats.

VIMS is engaging the aquaculture industry and other user groups in the development of Environmental Codes of Practice and Best Management Practices (BMPs). VIMS is also studying the impacts of clam aquaculture on benthic invertebrate prey for migratory shorebirds. This relationship will be important to understand when developing BMPs for clam aquaculture on the seaside.

The Eastern Shore will soon have a new "Shorekeeper" to help keep watch over the seaside. A newly established organization, the Virginia Eastern Shorekeeper, has hired a "ShoreKeeper" who will develop a training program for volunteer Shorekeepers, conduct on-the-water observations to investigate, assess and document citizen allegations of harmful activities, participate in public processes, and minimize the potential for conflict among users of these waters.

The Shorekeeper will pay particular attention to ensuring that oyster reef sanctuaries are protected from harvest and that eelgrass beds planted under the auspices of the Seaside Heritage Program are protected. The Shorekeeper and his cadre of volunteers could be an effective tool in protecting sensitive seaside resources such as plover and other rare bird nests on the beaches, as well as providing additional pairs of eyes to alert the Marine Resources Commission's Marine Patrol Officers.

Development of sustainable ecotourism opportunities through construction or enhancement of public access sites, creation of a canoe/kayak water trail and map, and an ecotour guide certification course:

To encourage a growing interest by nature tourists attracted to the wealth of wildlife and spectacular vistas on the seaside, the Virginia Seaside Heritage Program partners have begun development of a Seaside Canoe/Kayak Water Trail. The Accomack-Northampton Planning District Commission has identified locations for improved non-motorized launch access at three Seaside sites, and will work with the local governments for approval.

The A-NPDC held Seaside Water Trail Planning Workshops in Accomack County, Northampton County, and the Town of Chincoteague in September. Attendees reviewed maps and discussed what type of water trail they would like to see on the Eastern Shore's Seaside. They identified a range of issues to consider in the plan, including conflicts with powerboats, impacts to wildlife, need for water safety information, and improvements to canoe and kayak launch facilities. A draft Seaside Water Trail Plan with proposed canoe and kayak paddling routes and recommended launch site improvements will be presented at public meetings in the coming months.

SouthEast Expeditions of Cape Charles, Virginia will provide technical expertise in planning and mapping the water trail. The ecotour business has helped conduct the Water Trail Planning Workshops and is paddling the proposed water trail segments to ensure feasibility. It will also provide technical and safety information for a planned water trail map, guide, and Web site.

The Virginia Seaside Heritage Program will also make improvements to public access sites along the seaside portion of the new, self-guided Birding and Wildlife Trail as part of the effort to enhance ecotourism on the Eastern Shore.

Northampton County is converting a seaside landfill to a new park. Already popular with bird watchers, the county is working with the Seaside Heritage Program, government, and other groups to create a park with room for not only natural habitats but also play spaces and renewable energy resource projects. It is located on waterfront property off Seaside Road north of Oyster, Virginia. This waterfront park and its trails will be an important link in the Seaside Heritage Program's Water Trail. The county is working with the Virginia Department of Environmental Quality, the Environmental Protection Agency, and the Army Corps of Engineers to assure the site restoration is adequate for safe reuse. The park should be open by 2005.

For more information about the new Virginia Seaside Heritage Program, please contact Laura McKay at (804) 698-4323 or lbmckay@deq.state.va.us. Visit the Seaside Heritage Program Web site at http://www.deq.state.va.us/coastal/vshpweb/homepage.html for more information, including descriptions for the projects mentioned above.

Virginia Coastal Nonpoint Source Pollution Program

On May 15, 2001, Virginia became the sixth state to receive full approval of its *Coastal Nonpoint Pollution Control Program* from NOAA and EPA. Development of the program was initiated in the fall of 1992 in response to Section 6217 of the Coastal Zone Management Act Reauthorization Amendments of 1990. Section 6217 of the Act requires that state's with an approved coastal zone management program, develop a Coastal Nonpoint Source Pollution Control Program. The statute is meant to restore and protect coastal water quality through the application of economically achievable "best management practices" implemented through enforceable state policies and mechanisms. The federal government defines state enforceable policies and mechanisms as state and local regulatory controls and/or non-regulatory incentive programs combined with state enforcement authority.

There are 56 management measures contained in the *Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters*, a comprehensive technical document issued by EPA on methods to abate and control nonpoint pollution in coastal areas. The chapters include management measures in the following areas: agriculture, forestry, urban areas, marinas and recreational boating, and hydromodification (channelization and channel modification, dams, and streambank and shoreline erosion). This document is available on EPA's Web site at http://www.epa.gov/owow/nps/MMGI/

In order to gain approval of its Coastal Nonpoint Pollution Control Program, Virginia was required to show that:

1) state programs include appropriate management measures (defined in the above guidance) to control NPS pollution;
2) the state has a means of implementing the management measures, and;
3) the state has sufficient statutory authority and enforcement capabilities to ensure implementation of management measures to reduce NPS pollution impacts on coastal resources.

With approval of its Coastal Nonpoint Pollution Control Program, Virginia remains eligible for full funding under the Coastal Zone Management Act and Section 319 of the Clean Water Act.

Following are some of the projects that contributed to the approval of Virginia's Program:

- A series of workshops on the proper use of irrigation systems and development of informational material on irrigation best management practices;
- Development of a web-enabled database for use by local government to track erosion & sediment control activities; development of a model local stormwater ordinance; and an economic evaluation of incorporating BMPs into site design;
- Development of shorelands planning protocol for use by local governments to enhance planning capabilities for areas adjacent to shorelands;
- A statistical analysis of the impact of channelization activities and dams in Tidewater Virginia on instream & riparian habitat;
- A plasticulture guidebook for local government and farmers recommending practices to protect water quality for operations using plastic mulch;
- Development of the Virginia Clean Marina Program to provide technical assistance to marinas and recreational boaters.

For more details on projects and products produced through the Virginia Coastal Nonpoint Pollution Program, visit http://www.dcr.state.va.us/sw/czreauth.htm.

Virginia Clean Marina Program

There are approximately 1000 marinas and 250,000 boaters sharing the natural and economic benefits of Virginia's waterways. With each new boater and marina operator the potential impact to our

waterways from nonpoint source pollution increases. Studies have shown, however, that an increasing number of recreational boaters support efforts to prevent and reduce pollutants from entering Virginia's waterways, and that higher occupancy rates exist at marina's where BMPs have been put into place.

On January 12, 2001, marina operators, marine industry representatives and state officials launched the Virginia Clean Marina Program at the Virginia Boat Show. The Program, funded by the Virginia Coastal Program with CZMA grants from NOAA, is a voluntary initiative. This initiative is designed to educate and give technical support and special recognition to marinas that implement Best Management Practices (BMP's) that go above and beyond regulatory requirements, minimizing potentially negative impacts on water quality and coastal resources. The program is a joint agency initiative between the Department of Environmental Quality, Department of Conservation and Recreation and Virginia Sea Grant at the Virginia Institute of Marine Science.

A Marina Technical and Environmental Advisory Committee (MTEAC), made up of representatives from Virginia's coastal network of state agencies, the marine trade industry, and the recreational boating and environmental communities, was established in 2000 to direct development of the Virginia Clean Marina Program. This committee spent several months refining a Virginia Clean Marina Guidebook for use by marina operators and recreational boaters. The Guidebook provides information on implementing best management practices (BMPs) at marinas. It also provides summaries of the pertinent state and federal laws affecting marinas, as well as agency contacts for more information. Fact sheets provided in the guidebook can be copied and distributed to boaters. The guidebook is available on-line at http://www.vims.edu/adv/vamarina/. A Marina Technical Advisory Program was established at the Virginia Institute of Marine Science Sea Grant Office in 1999. A Marina Technical Advisory Specialist is currently focusing on developing technical information on environmental and economic issues, and working with marinas who have pledged to achieve voluntary designation as a Virginia Clean Marina.

As of the end of 2003, 16 marinas have been awarded Virginia Clean Marina Designation. Seventeen marinas have pledged to participate in the program and are working toward designation. The goal is to have at least fifty full-service Virginia Clean Marinas by September 2004.

For further information about Virginia's Coastal Nonpoint Pollution Control Program, and the Virginia Clean Marina Program and other coastal nonpoint program initiatives, please contact Mark Slauter, (804) 692-0839 or e-mail: mslauter@dcr.state.va.us. Visit the Virginia Clean Marina Web site at http://www.deq.state.va.us/vacleanmarina/ for more information and continuous updates on the Program's growing partnership.

Virginia Oyster Heritage Program

The oyster is a keystone species in Virginia's coastal waters. Not only do oyster reefs provide habitat for many species of finfish and shellfish; they are natural water purifiers. They filter algae and sediments from our coastal waters, which increases water clarity and improves light penetration. A single adult oyster can filter up to 60 gallons of water a day. Seagrass beds, which require light, benefit from the oyster's filtering efforts and in turn provide habitat and feeding grounds for many other important species of fish and birds. The presence of seagrass is a key indicator of good water quality. The oyster resources of the Chesapeake Bay have been in a state of continuing decline for at least the past century. Before their decline, the Bay's oysters could filter an amount of water equal to the volume of the entire Bay in three to six days. Today, it takes a year or more for our remaining oysters to do the same job. There is no doubt that oysters and oyster reefs provide us with very direct economic and environmental benefits.

In March 1999, the Virginia Department of Environmental Quality, through the Virginia Coastal Program, and the Virginia Marine Resources Commission, launched a bold initiative to capitalize on recent advances to restore oyster reefs. The Coastal Program and VMRC established a partnership of Virginia state agencies, federal agencies, nonprofit organizations and business groups to form the Virginia Oyster Heritage Program. This Program has marshaled the collective resources of its partners toward a large-scale oyster restoration effort and has served as a catalyst for a Baywide commitment for a 10-fold increase in oyster populations over the next 10 years, and helped galvanize a Baywide strategy

to meet this commitment. There was a significant new commitment of federal, State, and private funds for the Virginia Oyster Heritage Program and for Baywide oyster restoration efforts using a similar model.

The goals of the Virginia Oyster Heritage Program are to construct 3-dimensional (608 feet tall) oyster broodstock sanctuary reefs and create harvest enhancement areas by spreading a 10 inch deep layer of shell around the broodstock sanctuary reefs. Other goals include providing a sustainable fishery for Virginia watermen, monitoring reefs to determine their success in increasing oysters, checking water clarity and biodiversity, providing educational materials on the oyster restoration effort, training and using volunteer for reef restocking efforts and encouraging backyard oyster gardening" to augment restoration efforts.

Progress to Date

The Virginia Oyster Heritage Program has constructed nine major reefs in the Rappahannock River, several in Tangier Sound and others in Hampton Roads and on the seaside of the Virginia's Eastern Shore. Hundreds of acres of enhanced harvest area have been cleaned and improved by the addition of live oysters and cultch. A map of reef restoration sites is located on the Virginia Oyster Heritage Program Web site at http://www.deq.state.va.us/oysters/buildb.html

Long term survivability of sanctuary reef oysters is still unknown. Mortality due to oyster diseases remains high. However another main element of the VOHP is monitoring and evaluating the success of these reef-building efforts in order to improve our restoration practices. A study by the Virginia Institute of Marine Science, College of William and Mary is currently investigating oyster survival on varying reef surfaces. Monitoring by the Virginia Marine Resources Commission and the Virginia Institute of Marine Science for oyster populations on all of the 2-D harvest areas restored in the first and second years of the VOHP. This monitoring showed there was an excellent spatset throughout most of the areas in the Rappahannock River and standing stocks have increased since 2000. There also continues to be an excellent spatset on oyster reefs on Seaside.

The new sanctuary reefs were built using more than one million bushels of cultch, a combination of dredged fossil shells, shucked oyster shells, and surf clam shells. Within three of these new reefs, tests are being conducted to evaluate both ground, recycled concrete, and recycled local shells as reef construction materials. Shell availability for future oyster restoration efforts will be one of the greatest challenges in the near future, and the partnership base of he Oyster Heritage Program has facilitated progress in addressing this issue. Initial results have shown that both the ground concrete and recycled shell have performed similarly to fresh shells. Virginia received a permit to mine fossil shells in the James River in 2001, and this activity provided most of the shells for the harvest areas.

Reef construction on the Eastern Shore is done in tandem with sea grass restoration. In 2001, more than 4 million eelgrass seeds were planted on more than 25 acres in South and Cobb Bays. A total of 1.8 million eelgrass seeds were planted in 2002. Eastern Shore plantings are doing very well. Now completing their fourth year of study, the Virginia Marine Resources Commission and the Virginia Institute of Marine Science on the Eastern Shore are focusing on the interdependent relationship between oysters and sea grass. This study, as well as others in the Chesapeake Bay, suggests that the ecological value of oyster reefs extends to the survival and abundance of sea grass, an important water quality indicator.

In total, the Oyster Heritage Program resulted in more than $3 million for oyster restoration funding for the lower Rappahannock during the 3 years of the project, including $1,500,000 in Coastal Program funding and funds from the Virginia Marine Resources Commission and the Army Corps of Engineers. Funds from the Saltwater Recreational Fishing License Fund and the Chesapeake Bay Restoration Tax Check-off were also allocated to the Program. This has facilitated the largest, targeted restoration effort that has ever been undertaken in the Chesapeake Bay. Additionally the VOHP has leveraged over $10 million for oyster restoration statewide. An annual congressional appropriation through NOAA has provided about $1 million per year for the past two years.

A non-profit foundation was established in 2000 to carry the private fundraising aspects of the Virginia Oyster Heritage Program. The Virginia Oyster Reef Heritage Foundation seeks and accepts funds on behalf of the Program in order to achieve the Program's goals. The Foundation has raised over $400,000, including monies from a Virginia Environmental Endowment challenge grant. A steering

committee comprised of representatives of key partners in the Program provides direction in the allocation of these funds. The Foundation serves as a repository of private funds needed to match challenge grants and public agency grants.

In 2002, the Virginia Coastal Program was selected as a semi-finalist for the prestigious **Innovation in American Government Award**, given by Harvard's Kennedy School of Government, for creating the Virginia Oyster Heritage Program. The Innovations Awards recognize outstanding examples of creative problem solving in the public sector.

For more information about the Virginia Oyster Heritage Program, please call Laura McKay, Coastal Program Manager at (804) 698-4323, or Jim Wesson, Virginia Marine Resources Commission, at (757) 247-2121. Visit the Virginia Oyster Heritage Program Web site at http://www.deq.state.va.us/oysters/ for more details about reef construction and monitoring and the program's education efforts.

Virginia Southern Watershed Special Area Management Plan

Since 1992, the Coastal Program has been working in partnership with the cities of Chesapeake and Virginia Beach, and the Hampton Roads Planning District Commission (HRPDC) to develop a Special Area Management Plan (SAMP) for the Southern Watershed Area.

The Southern Watershed Area Management Program (SWAMP) focuses on the development of new and enhanced enforceable policies that protect significant wetland habitat and water quality. The SWAMP seeks to minimize the adverse impact of continued urbanization on the natural resources of the Southern Watershed Area (SWA) by improving the range of tools available to Virginia Beach and Chesapeake to control new development.

The SWA, located in Southeastern Virginia, covers approximately 325 square miles and makes up the southern portions of the cities of Chesapeake and Virginia. The SWA is bordered by the Atlantic Ocean on the east, the Great Dismal Swamp on the west and the North Carolina border on the south, and contains three sub-watersheds: the Back Bay, North Landing River and the Northwest River. The northern area of the two cities is dominated by a pattern of urban development, as are the two adjacent cities of Norfolk and Portsmouth. Industrial development associated with the port facilities and military uses, such as Camp Pendleton and Oceana Naval Station in Virginia Beach, are predominant upon the landscape. The southern portion of these two cities is rural in character, and the land uses are primarily agricultural, silvicultural, and residential.

The Southern Watershed contains extensive wetlands, including a variety of rare swamp, pocosin and marsh communities that drain into the Albemarle-Pamlico Sound. The Northwest River is the primary source of drinking water for the City of Chesapeake. The area is one of the most biologically diverse regions of the state, supporting more than 40 rare species and 10 terrestrial, estuarine and palustrine wetland communities.

The primary coastal management problem facing the Southern Watershed is the need to preserve its significant natural resources in the face of increasing population and development pressure. As these pressures increase a coordinated effort to minimize the adverse impact of continued urbanization on the natural resources of the Southern Watershed is essential.

The five objectives of the SWAMP are consistent with the Comprehensive Plans of Chesapeake and Virginia Beach and meet the Special Area Management Objectives under the Coastal Zone Management Act:

- To protect and enhance water supplies and natural resources conservation.
- To preserve open lands to help protect and enhance water quality.
- Ensure compatibility of recreational activities and commerce with natural resource protection.

- To maintain the rural character of the Southern Watershed, while providing for rural residential development.

- To sustain agricultural and forestal activities in the Southern Watershed.

To achieve the SWAMP objectives as contained in a Memorandum of Agreement between the two cities, the following enforceable policies, which are based upon, and incorporate, locally defined needs and opportunities, are being pursued:

A. Refine development controls to protect water quality and preserve critical habitat.
Tasks: 1) Establishment of a Rural Area Preservation Program in the City of Chesapeake and, 2) Establishment of a mitigation strategy.

B. Improve the effectiveness of preservation districts.
Tasks: 1) Modify the definition and delineation of P-1 preservation district in the Virginia Beach Zoning Ordinance and, 2) Modify the definition and delineation of C-1 conservation District in the Chesapeake Zoning Ordinance.

C. Protect habitat through easements and information exchanges.
Tasks: 1) Development of Conservation Easement Memorandum of Agreement and, 2) Development of an Information Exchange Memorandum of Agreement.

D. Improve urban and agricultural BMPs.
Tasks: Development of a Memorandum of Agreement on Urban and Agricultural Stormwater Best Management Practices.

E. Manage competing waterway uses.
Task: Development of a Waterway Use Conflict Management Memorandum of Agreement. (Signed MOA described below.)

In addition, the SWAMP will highlight the economic value of the natural resources through the exploration of sustainable economic development initiatives, including environmentally compatible industries such as nature tourism and sustainable agriculture. The SWAMP also emphasizes research, e.g. water quality data analysis, to support the policy changes, and provisions for stakeholder involvement.

Development of the SWAMP brings a broad cross-section of stakeholders into a cooperative planning process. One example of this cooperative approach is the Water Quality Task Force, which was established to analyze existing water quality data, evaluate the current methods and procedures used to monitor water quality, and make recommendations for future actions. This Task Force includes representatives from the DEQ, U.S. Fish and Wildlife Service, U.S. Geological Survey, DGIF, DCR Division of Natural Heritage, Back Bay Restoration Foundation, DCR Division of Soil and Water Conservation, Hampton Roads Sanitation District and the cities of Chesapeake and Virginia Beach.

One of the most significant accomplishments under SWAMP is the development of a Memorandum of Agreement between the federal, state and local agencies involved in the wetlands mitigation process. The MOA identifies a set of conservation corridors in the SWA and establishes a methodology for enhancing the site selection process when off-site mitigation is necessary. A second significant focus area under SWAMP has involved efforts to improve environmental stewardship when new development takes place in the SWA. Randall Arendt, a nationally recognized planning expert, was hired as a consultant to critique the development controls currently used by Chesapeake and Virginia Beach and to develop site plans for conservation subdivisions in the two cities. Mr. Arendt worked directly with a developer in Chesapeake and a modified version of Mr. Arendt's site plan is currently in the development review process in Chesapeake. Chesapeake is also in the process of reviewing its subdivision ordinance and is considering the inclusion of a conservation subdivision section based on Mr. Arendt's recommendations. In addition, other localities in the Hampton Roads Planning District have expressed an interest in the work of Mr. Arendt.

Water Use Conflict Educational MOA Signed for the North Landing River

Representatives from a broad range of local, state and federal agencies gathered on April 30, 2001 at Munden Point Park in Virginia Beach to sign a Memorandum of Agreement (MOA) to improve water use conflict education for the North Landing River. The MOA outlines recommended water use areas to minimize conflict between the diverse set of recreational and commercial users of the River. In addition, the use areas are intended to aid in protection of the valuable wetland ecosystem that surrounds the river by minimizing damage by watercraft.

The MOA includes a Water Use Plan Map for the North Landing River that depicts the areas of the River that are best suited for Low Impact Recreation, General Recreation and Special Use/High Speed Recreation. Low Impact recreational activities such as canoeing and kayaking are recommended in the smaller tributaries and the narrow northern portion of the River. General Recreational activities, which include most motor boat usage, are recommended in the wider southern section of the River. Finally, high-speed recreational activities such as water skiing and jet skiing are recommended in the broadest and deepest section of the River.

The Cities of Chesapeake and Virginia Beach, Hampton Roads Planning District Commission, Virginia Department of Environmental Quality, Virginia Department of Conservation and Recreation, Virginia Department of Game and Inland Fisheries, United States Army Corps of Engineers, United States Coast Guard and the United States Fish and Wildlife Service all participated in the development of the MOA and signed the finished document.

Implementation of the MOA will include development of educational materials for inclusion in boater safety programs and installation of signs with the Water Use Plan Map at launch areas. In addition, a survey of boaters on the North Landing River will be performed both before and after implementation of the educational program to determine its effectiveness.

For more information on the SWAMP, please contact Eric Walberg, HRPDC, at (757) 420-8300 or ewalberg@hrpdc.seva.net, or Laura McKay, Virginia Coastal Program Manager, at (804) 698-4323 or lbmckay@deq.state.va.us.

Other Program Funded Initiatives

Environmentally Sensitive Site Design Efforts Highlight Water Quality Benefits

Environmentally sensitive site design, which can minimize land disturbance, preserve indigenous vegetation and minimize impervious surface and runoff, is the objective of a handbook – *Better Site Design* - developed by Virginia's Chesapeake Bay Local Assistance Department with funding from the Coastal Program. The handbook provides Virginia-specific site design techniques and outlines "model development principles" for consideration by local planners, developers, citizen groups, design professionals, and policy makers to change the standard approach to site design. The results can be more environmentally sensitive, economically viable, and locally appropriate development. Careful site design and layout are also an integral part of addressing the Chesapeake Bay Preservation Act, which was incorporated into Virginia's Coastal Program in 2000. The Model Development Principles were adapted from a series of 22 nationally endorsed principles. A workshop hosted by CBLAD for local government officials included a presentation on four Virginia case studies illustrating the economic and water quality benefits of using the better site design techniques. All 84 of Virginia's coastal localities received the better site design publication. CBLAD also conducted a follow-up study, with funding from the Coastal Program, of the *Impediments to Better Site Design*.

New Groundwater Ordinance Adopted in Northampton County

Northampton County is the site of the first "special area" management plan developed by the Virginia Coastal Program. The plan is designed to stimulate sustainable economic growth while protecting precious natural resources. Northampton County, although a rural community with a depressed economy, is brimming with a wealth of unique natural and cultural resources. The SAMP was developed to preserve bird and fish habitats, control cumulative and secondary impacts of coastal development by maintaining maximum vegetative cover of wildlife habitat and nutrient uptake, maintain a sense of place

and quality, and to develop responsible heritage tourism, aquaculture and other sustainable industries. As a result of the work completed by this SAMP and the interagency effort to collect and scientifically document migratory bird habitat needs, the County has a new groundwater ordinance. Additionally, the Northampton County Board of Supervisors will consider a habitat or vegetation protection overlay district ordinance in November of 2003. If adopted, this ordinance would maximize vegetative cover for wildlife as well as benefit water quality and land value.

Local Enforcement Positions Focus on Water Quality

The Virginia Coastal Program funds four planning and enforcement positions in Tidewater localities to enhance compliance with Erosion and Sediment Control, Stormwater, Wetlands and Chesapeake Bay Act regulations. The localities assisted are the counties of Middlesex, Essex, King William, King and Queen, Westmoreland, Northumberland, Richmond and Lancaster, as well as the Town of Tappahannock. The planning and enforcement positions typically assist the localities with site plan review, site inspections and compliance reviews. A portion of their time is also spent on education and outreach programs. For example, the Regional Environmental Inspectors in the Northern Neck produced a brochure for citizens planning shoreline erosion control projects entitled *Plan, Preserve and Permit*.

Publications Funded by the Virginia Coastal Program Emphasis Water Quality Benefits

A brochure produced by the Virginia Marine Resources Commission and the Virginia Institute of Marine Science (VIMS) ***- Shoreline Erosion Problems?: Think Green -*** helps ensure that property owners are aware of nonstructural alternatives to shoreline erosion. The brochure illustrates how using marsh grasses not only protects their property but benefits water quality and wildlife. This brochure has been very popular among property owners making reprints necessary. The Virginia Department of Conservation and Recreation developed a field version of Virginia's Erosion and Sediment Control Handbook at the request of many individuals, businesses and government agencies. Over 4,000 copies of the handbook have been distributed in the coastal areas of Virginia; and, another VIMS publication titled **Shoreline Management in Chesapeake Bay** describes and illustrates specific, practical response to shoreline management issues. It looks at how the physical environment, man-made constructions, and land-use patterns impact one another, and presents solutions to management problems with an eye to cost-effectiveness, sound construction, coastal hazards, property loss, habitat preservation and water quality.